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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/558,169	11/22/2005	Guenther Baschek	2003P033453WOUS	1917
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EXAMINER				
ENIN-OKUT, EDUE				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/558,169

Applicant(s)

BASCHEK ET AL.

Examiner

Edu E. Enin-Okut

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 11/22/05, 5/2/06
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of Applicant's claim for foreign priority to German Patent Application No. 103 23 882.4, filed on May 26, 2003, under 35 U.S.C. 119(a)-(d). A certified copy of that application has been received.

Drawings

2. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figures 3 and 4 do not show the "embossing" designated by reference numeral 5 in the description.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Duplicate Claims

4. Applicant is advised that should claims 14, 17, 20, 22, 24 and 26 be found allowable, claims 15, 18, 21, 23, 25 and 27 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 13, 15, 18, 21-23, 25, 27 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Claims 13 and 22-23 recite the phrase “at least approximately” which renders the claim indefinite.
- Claim 30 depends from two different claims; thereby, making the claim indefinite.
- Claims depending from claims rejected under 35 USC 112, second paragraph are also rejected for the same.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 12-16, 22-23 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Mattejat et al., U.S. Patent No. 5,472,801.

Regarding claim 12, Mattejat discloses a fuel cell [fuel cell block 36], comprising a separator [38] disposed between two electrolyte-electrode units [77,80,82,84,77] (Abstract; 6:54-58; Figs. 4-5), wherein

- the separator is formed from two plates [40,42] each having an embossing and touching at contact surfaces (Figs. 4-6), wherein
- a first fluid chamber for a coolant [chamber 72] is formed between the two plates and a second fluid chamber [channels /chambers 74 or 76] for a gas is formed between each plate and the adjacent electrolyte-electrode unit in each case (6:63-7:6; Figs. 4-6), wherein
- the first fluid chamber for the coolant has two subchambers each facing one of the two plates and wherein the coolant can only flow alternately through the two subchambers (7:49-66; Figs. 4-6).

As to the first fluid chamber for the coolant has two subchambers each facing one of the two plates and wherein the coolant can only flow alternately through the two subchambers, one of ordinary skill in the art would readily appreciate that the cross-sectional images of the fuel cell block of Mattejat shown in Figs. 4-6 illustrate the areas where the protuberances make contact with each other. That artisan would appreciate that of the fuel cell block shown in those figures can present an a cross-section similar to that described by Applicant in Fig. 2 of its application when a cross section is take in area other than the one shown by Mattejat.

Regarding claim 13, Mattejat discloses that the plates have at least approximately identical embossings [protuberances] (5:52-57, 7:41-48; Figs. 4-6).

Regarding claims 14-15, Mattejat discloses that the embossings are formed as essentially circular depressions (5:52-57, 7:41-48).

Regarding claim 16, Mattejat discloses that the embossings of the plates are offset relative to one another (7:49-66).

Regarding claims 22-23, Mattejat discloses that the contact surfaces are distributed at least approximately uniformly over the surface of the separator (5:53-55; Figs. 4-6).

Regarding claim 28, the limitations recited in this claim have been addressed above with respect to claim 12.

9. Claims 12-13, 16-18 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizuno, U.S. Patent Application Publication No. 2004/0161658.

Regarding claim 12, Mizuno discloses a fuel cell [10], comprising a separator [18] disposed between two electrolyte-electrode units [MEA] (Abstract; para. 32, 33, 36; Figs. 3-4), wherein

- the separator is formed from two plates [18A, 18B] each having an embossing and touching at contact surfaces (para. 35; Fig. 4), wherein
- a first fluid chamber for a coolant [26] is formed between the two plates and a second fluid chamber [18Ag, 18Ac; 18Bc, 18Bg] for a gas is formed between each plate and the adjacent electrolyte-electrode unit in each case (para. 42, 43; Fig. 4), wherein
- the first fluid chamber for the coolant has two subchambers [26a, 26b] each facing one of the two plates and wherein the coolant can only flow alternately through the two subchambers (Fig. 4).

Regarding claim 13, Mizuno discloses that the plates have at least approximately identical embossings [grooves, ribs] (para. 37, 47; Fig. 4).

Regarding claim 16, Mizuno discloses that the embossings of the plates are offset relative to one another (Fig. 4).

Regarding claim 17-18, Mizuno discloses that the embossings of the plates are essentially rib-shaped (para. 14, 37, 47; Figs. 6A, 6B).

Regarding claim 20-21, Mizuno discloses that the contact surfaces are gold-plated (para. 52).

Regarding claims 22-23, Mizuno discloses that the contact surfaces are distributed at least approximately uniformly over the surface of the separator (para. 14; Fig. 3).

Regarding claim 28, the limitations recited in this claim have been addressed above with respect to claim 12.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattejat et al.

Mattejat is applied and incorporated herein for the reasons above.

Regarding claim 29, Mattejat teaches a component 38 used in a fuel cell block 36 composed of two plates 40,42 disposed between electrode-electrolyte units (Abstract; 5:34-36, 5:43-48, 6:54-65; Figs. 4-6). The plates form a chamber 72 used to move a coolant 86 through the fuel cell (6:62-66), and, in turn, reduce the cell temperature. The reference also teaches that the component 38 can be used may used not only in a fuel cell block but also in process control apparatuses, such as electrochemical cells, mass transfer equipment, humidifiers and condensers (7:67-8:4).

However, Mattejat does not expressly teach that its component 38 is a heating device.

One of ordinary skill in the art would appreciate that the component 38 of Mattejat cools a fuel cell using the transport of heat from the higher temperature electrode-electrolyte unit to the lower temperature coolant flowing through a chamber formed between plates of component 38. That artisan would also appreciate that: (1) this process can be reversed by flowing a medium through that chamber having a temperature higher than that of the electrode-electrolyte unit; and, (2) the component of Mattejat can be used in another location, such as disposed adjacent to the edge plate of a fuel cell, as evidenced by the alternative uses discussed by Mattejat.

Therefore, it would have been obvious to that artisan at the time of the invention to use the component of Mattejat as a heating device for a fuel cell because it is well-known in the art to provide heat to fuel cell components to allow the cell to continue to operate under conditions below its normal, ambient operating temperature, or to heat the cell during its start-up.

Regarding claim 30, the limitations recited in this claim have been addressed above with respect to claims 12 and 29.

9. Claims 17-19 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattejat et al. in view of Nolscher, U.S. Patent No. 6,080,502 (cited in IDS) and Enami, Japanese Patent No. 10-308,227 (cited in IDS).

Mattejat is applied and incorporated herein for the reasons above.

Regarding claim 17-18, Mattejat does not expressly teach that the embossings of the plates are essentially rib-shaped.

Nolscher teaches a separator 21 used in a fluid-cooled fuel cell that uses a rectilinear grooves or ducts to move cooling medium through the fuel cell (8:53-9:8; Figs. 4-5).

Further, Enami teaches the creation of coolant flow passages between using adjacent separators 1,2 with projecting parts which are ribbed-shaped, and the separators are disposed upon each other in manner where their primary axes offset, as shown in Figs. 1, 4 (Abstract; Figs. 1, 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilized the ribs, as taught by Nolscher and Enami, as the embossings of Mattejat because it is well known in the art to use a ribbed-shaped projections on separators to uniformly supply the entire cell surface with coolant (see Nolscher, Abstract) and, in turn, increase the efficiency of the fuel cell.

Regarding claim 19, Enami, discussed above, teaches that the embossings of the plates are rotated relative to one another (Abstract; Figs. 1, 4).

Regarding claims 24-27, Mattejat does not expressly teach that the total surface area of the contact surfaces is at least 10%, or 90%, of the surface area of the separator.

However, one of ordinary skill in the art would appreciate that the separators of Mattejat contacts an electrode-electrolyte unit over an amount, or percentage, of its surface area (see 6:54-58; Figs. 4-6). That artisan would also appreciate that the degree of contact of surface area of the separator plates affects the capacity to cool the fuel cell allowing more or less surface area of coolant to flow through.

Thus, one of ordinary skill in the art at the time of the invention would have found it obvious to assemble the fuel cell of Mattejat in a manner where the total surface area of the contact surfaces is at least 10% or 90% of the surface area of its separator as recited in claims 24-25 and 26-27, respectively, to optimize the amount of contact surface that affects the volume of coolant in contact with the separator plate depending on the amount of cooling needed by the fuel cell.

10. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattejat et al. in view of Yasuo et al., U.S. Patent Application Publication No. 2002/0187379.

Mattejat is applied and incorporated herein for the reasons above.

Regarding claim 20-21, Mattejat does not expressly teach that the contact surfaces are gold-plated.

Yasuo teaches separator for a fuel cell a where the surface of the separator is plated with a precious metal, such as gold, platinum, or nickel, that has high corrosion resistance and high conductivity (Abstract; para. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to plate the contact surfaces of Mattejat, as taught by Yasuo, to impart those areas with corrosion resistance and high conductivity.

Conclusion

9. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Funatsu et al., U.S. Patent No. 6,490,778, discloses a fuel cell separator comprising a multiple uneven plate having multiple uneven portions, the plate being bent to form a plurality of second grooves, the second grooves forming a corresponding plurality of trough and crest lines, the trough and crest lines crossing the first grooves. With this structure, the convex portions determined by the first and second grooves become contact points electrically continuous to the electrodes of the fuel cell, and these grooves can be used as channels for gas and coolant.

Correspondence / Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday-Thursday, 8 a.m. - 4 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E Enin-Okut/
Examiner, Art Unit 1795

/Susy Tsang-Foster/
Supervisory Patent Examiner, Art Unit 1795